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EXAMINER

FAULK, DEVONA E

ART UNIT

PAPER NUMBER

2644

DATE MAILED: 08/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/728,527

Applicant(s)

BIZJAK, KARL M.

Examiner

Devona E. Faulk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1,3-5,21,28 and 29** are rejected under 35 U.S.C. 102(b) as being anticipated by Chu (U.S. Patent 5,305,307).

3. Regarding **claims 1 and 2**, Chu discloses an echo canceling device for reducing acoustic feedback between a loudspeaker and microphone comprising a microphone signal (m(z)) (figure 1, column 1, lines 58-65) which reads on “providing an input signal” ; a signal splitter (16) (Figure 1) that separates the microphone signal into twenty-nine distinct frequency bands (column 4, lines 18-26), which reads on “parsing the input signal into a plurality of split signals in accordance with a predetermined criteria”; a bank of noise filters (22), a bank of center clippers (20) that includes a center clipper for each band-limited microphone signal (column 4, line 58-column 5, line 32) , either of which reads on “generating split reference signals for each of at least two of the split signals” and “generating a reference signal in accordance with a combination of the split signals”; and a signal composer (24) that assembles the band-limited signals into a composite signal, which reads on “combining a plurality of the split reference signals in to a single reference signal” . The method is inherent in the functionality of the system.

All elements of **claim 3** are comprehended by claim 2.

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Regarding **claim 4**, Chu further teaches that the microphone (10) converts speech and other acoustic signals in a room into an analog electric microphone signal (column 3, lines 58-65). Therefore, all elements of claim 4 are comprehended by claim 2.

Regarding **claim 5**, Chu further teaches that the microphone (10) converts speech and other acoustic signals in a room into an analog electric microphone signal (column 3, lines 58-65). Therefore, all elements of claim 5 are comprehended by claim 1.

4. Regarding **claims 19 and 27**, Chu discloses an echo canceling device for reducing acoustic feedback between a loudspeaker and microphone comprising a microphone signal ($m(z)$) (figure 1, column 1, lines 58-65) which reads on “an input signal” ; a signal splitter (16) (Figure 1) that separates the microphone signal into twenty-nine distinct frequency bands (column 4, lines 18-26) which reads on “a signal splitter which parses the input signal into a plurality of split signals in accordance with a predetermined criteria”; a bank of noise filters (22), a bank of center clippers (20) that includes a center clipper for each band-limited microphone signal (column 4, line 58-column 5, line 32) , either of which can read on “reference generator for generating split reference signals for each of at least two of the split signals” and “reference signal generator to generate a reference signal in accordance with a combination of the split signals , and a signal composer (24) that assembles the band-limited signals into a composite signal, which reads on a “combiner for combining a plurality of the split reference signals in to a single reference signal” .

Regarding **claim 21**, Chu teaches that the microphone (10) converts speech and other acoustic signals in a room into an analog electric microphone signal (column 3, lines 58-65). Therefore, all elements of claim 21 are comprehended by claim 19.

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All elements of **claim 28** are comprehended by claim 27.

Regarding **claim 29**, Chu teaches that the microphone (10) converts speech and other acoustic signals in a room into an analog electric microphone signal (column 3, lines 58-65). Therefore, all elements of claim 29 are comprehended by claim 27.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 6,9, 10,13, 20,23,24,30,32-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu (U.S. Patent 5,305,307) in view of Waldhauer (U.S. Patent 4,882,762).

Claim 6 claims the method of claim 1 wherein the predetermined criteria used in the parsing step is a band split filter. As stated above apropos of claim 1, Chu meets all elements of that claim. Therefore, Chu meets all elements of claim 6 with the exception of the claimed matter. Chu fails to teach that the signal splitter is a band split filter. Waldhauer teaches of band split filter (See Figure 1). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Waldhauer's band split filter as the signal splitter in order to separate the signal into low and high frequency bands.

Claim 9 claims the method of claim 6 wherein the combining step includes combining at least some of the bands of a band split filter. As stated above apropos of claim 6, Chu meets all

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elements of that claim. Therefore, Chu meets all elements of claim 9 with the exception of the claimed matter. Chu teaches of combining at some of the bands of a signal splitter. Chu fails to teach that the signal splitter is a band split filter. Waldhauer teaches of band split filter (See Figure 1). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Waldhauer's band split filter as the signal splitter in order to separate the signal into low and high frequency bands.

Claim 10 claims the method of claim 9 wherein the combining step includes adding of the split signals. As stated above apropos of claim 6, Chu meets all elements of that claim. Therefore, Chu meets all elements of claim 9 with the exception of the claimed matter. Chu teaches of adding the split signals. Chu fails to teach that the signal splitter is a band split filter. Waldhauer teaches of band split filter (See Figure 1). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Waldhauer's band split filter as the signal splitter in order to separate the signal into low and high frequency bands.

Claim 13 claims the method of claim 2 wherein the predetermined criteria used in the parsing step is a band split filter. As stated above apropos of claim 2, Chu meets all elements of that claim. Therefore, Chu meets all elements of claim 13 with the exception of the claimed matter. Chu fails to teach that the signal splitter is a band split filter. Waldhauer teaches of band split filter (See Figure 1). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Waldhauer's band split filter as the signal splitter in order to separate the signal into low and high frequency bands.

Claim 20 claims the apparatus of claim 19 wherein the signal splitter is a band split filter. As stated above apropos of claim 1, Chu meets all elements of that claim. Therefore, Chu meets

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all elements of claim 6 with the exception of the claimed matter. Chu fails to teach that the signal splitter is a band split filter. Waldhauer teaches of band split filter (See Figure 1). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Waldhauer's band split filter as the signal splitter in order to separate the signal into low and high frequency bands.

Claim 23 claims the apparatus of claim 20 wherein the combiner combines at least some of the bands of the band split filter. As stated above apropos of claim 20, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 15 with the exception of the claimed matter. Chu teaches of combining at least some of the bands of a signal splitter. He fails to teach that the signal splitter is a band split filter. Waldhauer teaches of a band split filter. All elements of claim 15 are comprehended by claim 14. Therefore, claim 15 is rejected for reasons given above apropos of claim 14.

Claim 24 claims the apparatus of claim 23 wherein the combiner adds at least some of the split signals. Chu teaches of adding the split signals. All elements of claim 24 are comprehended by claim 23. Therefore, claim 24 is rejected for reasons given above apropos of claim 23.

Claim 26 claims the method of claim 23 further including providing a soft clip on the split signals following the combining steps. As stated above apropos of claim 23, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 26 with the exception of the claimed matter. Chu teaches of a clipper bank applied to each of the split signals before combining. The clipper bank serves to attenuate corrected signals to eliminate any residue echo. Although, Chu teaches of clipping

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each individual split signal , it is obvious that the clipping could be done on the resultant signal after the split signals have been added. Thus it would have been obvious to one of ordinary skill in the art to provide clipping as claimed in order to eliminate any residue echo in the combined signal.

Claim 30 claims the apparatus of claim 27 wherein the signal splitter is a band split filter. As stated above apropos of claim 27, Chu meets all elements of that claim. Therefore, Chu meets all elements of claim 30 with the exception of the claimed matter. Chu fails to teach that the signal splitter is a band split filter. Waldhauer teaches of band split filter (See Figure 1). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Waldhauer's band split filter as the signal splitter in order to separate the signal into low and high frequency bands.

Claim 32 claims the apparatus of claim 30 wherein the combiner combines at least some of the bands of the band split filter. As stated above apropos of claim 30, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 30 with the exception of the claimed matter. Chu teaches of combining at least some of the bands of a signal splitter. He fails to teach that the signal splitter is a band split filter. Waldhauer teaches of a band split filter. All elements of claim 32 are comprehended by claim 30. Therefore, claim 32 is rejected for reasons given above apropos of claim 30.

Claim 33 claims the apparatus of claim 30 wherein the combiner adds at least some of the split signals. Chu teaches of adding the split signals. All elements of claim 33 are comprehended by claim 30. Therefore, claim 33 is rejected for reasons given above apropos of claim 30.

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Claim 34 claims the apparatus of claim 33 further comprising amplitude adjuster for scaling the split signals prior to the combiner. As stated above apropos of claim 33, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 34 with the exception of the claimed matter. Charpentier teaches of each band having adjustable attenuators. The attenuators read on scaling the split signals as claimed. All elements of claim 24 are comprehended by claim 24. Therefore, claim 25 is rejected for reasons given above apropos of claim 24.

Claim 35 claims the apparatus of claim 34 further comprising a soft clip on the output of the combiner. As stated above apropos of claim 34, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 35 with the exception of the claimed matter. Chu teaches of a clipper bank applied to each of the split signals before combining. The clipper bank serves to attenuated a corrected signals to eliminate any residue echo. Although, Chu teaches of clipping each individual split signal, it is obvious that the clipping could be done on the resultant signal after the split signals have been added. Thus it would have been obvious to one of ordinary skill in the art to provide clipping as claimed in order to eliminate any residue echo in the combined signal.

7. **Claims 7-8, 11-12,14-18,22,25 and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu (U.S. Patent 5,305,307) in view of Waldhauer (U.S. Patent 4,882,762) in further view of Charpentier et al. (U.S. Patent 5,321,758).

Claim 7 claims the method of claim 6 further including providing a plurality of bands in the band-split filter, and providing adjustable output levels for each band of the band-split filter.

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As stated above apropos of claim 6, the combination of Chu and meets all elements of that claim. Therefore, Chu meets all elements of claim 7 with the exception of the claimed matter. Chu reads on providing a plurality of bands in the band-split filter. Charpentier teaches of adjustable programmable attenuators (column 2, lines 45-51), each coupled to a band-pass filter. Thus it would have been obvious to one of ordinary skill in the art to use Charpentier's concept of having adjustable attenuators as claimed in order to compensate for a wide variety of hearing deficiencies.

Claim 8 claims the method of claim 6, including using the adjustable output levels for equalization. As stated above apropos of claim 6, Chu meets all elements of that claim. Therefore, Chu meets all elements of claim 8 with the exception of the claimed matter. Charpentier teaches of adjustable programmable attenuators (column 2, lines 45-51), each coupled to a band-pass filter. He further teaches that the adjustable attenuators are used to compensate for a wide variety of hearing deficiencies (column 2, lines 45-51). Therefore it is obvious that the attenuators would be used for equalization. Thus it would have been obvious to one of ordinary skill in the art to use Charpentier's concept of having adjustable attenuators as claimed in order to compensate for a wide variety of hearing deficiencies.

Claim 11 claims the method of claim 10 further including the step of scaling the split signals prior to the combining step. As stated above apropos of claim 10, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 11 with the exception of the claimed matter. Charpentier teaches of the concept of each band of a signal splitter having an attenuator. The attenuator reads on scaling

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the split signals as claimed. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use Fang's concept of scaling in order to provide noise reduction.

Claim 12 claims the method of claim 11 further including providing a soft clip on the split signals following the combining steps. As stated above apropos of claim 10, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 11 with the exception of the claimed matter. Chu teaches of a clipper bank applied to each of the split signals before combining. The clipper bank serves to attenuated a corrected signals to eliminate any residue echo. Although, Chu teaches of clipping each individual split signal , it is obvious that the clipping could be done on the resultant signal after the split signals have been added. Thus it would have been obvious to one of ordinary skill in the art to provide clipping as claimed in order to eliminate any residue echo in the combined signal.

Claim 14 claims the method of clam 13 further including providing a plurality of bands in the band split filter and providing adjustable output levels for each band of the band split filter. As stated above apropos of claim 13, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 14 with the exception of the claimed matter. Waldhauer teaches of a band split filter. It is obvious by its function that it provides a plurality of bands. Charpentier teaches of adjustable programmable attenuators (column 2, lines 45-51), each coupled to a band-pass filter. Thus it would have been obvious to one of ordinary skill in the art to use Charpentier's concept of having adjustable attenuators as claimed in order to compensate for a wide variety of hearing deficiencies.

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Claim 15 claims the method of claim 14 wherein the combining step includes combining at least some of the bands of a band split filter. As stated above apropos of claim 14, the combination of Chu , Waldhauer and Charpentier meets all elements of that claim. Therefore, the combination meets all elements of claim 15 with the exception of the claimed matter. Chu teaches of combining at least some of the bands of a signal splitter. He fails to teach that the signal splitter is a band split filter. Waldhauer teaches of a band split filter. All elements of claim 15 are comprehended by claim 14. Therefore, claim 15 is rejected for reasons given above apropos of claim 14.

Claim 16 claims the method of claim 15 wherein the combining step includes adding of the split signals. Chu teaches of adding the split signals. All elements of claim 16 are comprehended by claim 15. Therefore, claim 16 is rejected for reasons given above apropos of claim 15.

Claim 17 claims the method of claim 16 further including the step of scaling the split signals prior to the combining step. As stated above apropos of claim 16, the combination of Chu , Waldhauer and Charpentier meets all elements of that claim. Therefore, the combination meets all elements of claim 17 with the exception of the claimed matter. Chu teaches of the concept of each band of a filter bank (110) having adjustable attenuators. The attenuators read on scaling the split signals as claimed. All elements of claim 16 are comprehended by claim 15. Therefore, claim 17 is rejected for reasons given above apropos of claim 16.

Claim 18 claims the method of claim 17 further including providing a soft clip on the split signals following the combining steps. As stated above apropos of claim 17, the combination of Chu, Waldhauer and Charpentier meets all elements of that claim. Therefore, the

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combination meets all elements of claim 11 with the exception of the claimed matter. Chu teaches of a clipper bank applied to each of the split signals before combining. The clipper bank serves to attenuated a corrected signals to eliminate any residue echo. Although, Chu teaches of clipping each individual split signal , it is obvious that the clipping could be done on the resultant signal after the split signals have been added. Thus it would have been obvious to one of ordinary skill in the art to provide clipping as claimed in order to eliminate any residue echo in the combined signal.

Claim 22 claims the apparatus of clam 20 further including providing a plurality of bands in the band split filter and providing adjustable output levels for each band of the band split filter. As stated above apropos of claim 20, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 14 with the exception of the claimed matter. Waldhauer teaches of a band split filter. It is obvious by its function that it provides a plurality of bands. Charpentier teaches of adjustable programmable attenuators (column 2, lines 45-51), each coupled to a band-pass filter. Thus it would have been obvious to one of ordinary skill in the art to use Charpentier's concept of having adjustable attenuators as claimed in order to compensate for a wide variety of hearing deficiencies.

Claim 25 claims the apparatus of claim 24 further comprising amplitude adjuster for scaling the split signals prior to the combiner. As stated above apropos of claim 24 , the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 25 with the exception of the claimed matter. Charpentier teaches of each band having adjustable attenuators. The attenuators read on scaling the split signals as

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claimed. All elements of claim 24 are comprehended by claim 24. Therefore, claim 25 is rejected for reasons given above apropos of claim 24.

Claim 31 claims the apparatus of claim 30 further including providing a plurality of bands in the band split filter and providing adjustable output levels for each band of the band split filter. As stated above apropos of claim 20, the combination of Chu and Waldhauer meets all elements of that claim. Therefore, the combination meets all elements of claim 30 with the exception of the claimed matter. Waldhauer teaches of a band split filter. It is obvious by its function that it provides a plurality of bands. Charpentier teaches of adjustable programmable attenuators (column 2, lines 45-51), each coupled to a band-pass filter. Thus it would have been obvious to one of ordinary skill in the art to use Charpentier's concept of having adjustable attenuators as claimed in order to compensate for a wide variety of hearing deficiencies.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 703-305-4359. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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